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OCT 5 2004

In re Application of :
Lawrence. G. Hopkins :
Application No. 10/806,775 : DECISION ON PETITION
Filed: March 22, 2004 :
Attorney Docket No. Hunt:FanArr1 :

This is a decision on the petition to make special originally filed on March 22, 2004. The petition is submitted pursuant to the practice established in MPEP § 708.02(II) "Infringement." The $130.00 petition fee has been received.

The petition is granted.

A review of the petition shows that petitioner has satisfied all of the requirements of the above-cited MPEP section. Accordingly, the examiner will treat this application as special throughout its prosecution. Prior to the next action on the merits, the examiner will conduct a rigorous search for potentially interfering applications. The interference search will be brought up to date prior to each successive action.

The Supervisory Patent Examiner of Patent Examining Art Unit 3753 will be notified of this decision, and will inform the assigned examiner to take action not inconsistent there with this decision.

PETITION GRANTED.

Stephen Marcus, Special Program Examiner,
Technology Center 3700

LAW OFFICE OF KAREN DANA OSTER, LLC
PMB 1020
15450 SW BOONES FERRY ROAD #9
LAKE OSWEGO, OR 97035

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2003

Application or Docket Number: 10806775

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	20	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	20 minus 20=	*
INDEPENDENT CLAIMS	2 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	385.00	OR	BASIC FEE	770.00
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL	385	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 20	Minus	** 20	=
Independent	* 2	Minus	*** 3	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875 (Rev. 10/03) — Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION EXAMINING OPERATIONS

Applicant:	Hopkins	Group Art Unit:	3745
Serial No.:	10/806,775	Examiner:	Nguyen, Ninh H.
Filed:	March 22, 2004	Docket No:	Hunt:FanArr1
Title:	Fan Array Fan Section in Air-Handling Systems		

AMENDMENT

Law Office of Karen Dana Oster, LLC
PMB 1020
15450 SW Boones Ferry Rd. #9
Lake Oswego, OR 97035
March 15, 2005

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the September 15, 2004 Office action, please amend the above-identified patent application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims that begins on page 4 of this paper.

Remarks/Arguments begin on page 11 of this paper.

Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 4, with the following rewritten paragraph:

--Air-handling systems (also referred to as an air handler) have traditionally been used to condition buildings or rooms (hereinafter referred to as "structures"). An air-handling system is defined as a ~~structure~~ system that includes components designed to work together in order to condition air as part of the primary system for ventilation of structures. The air-handling system may contain components such as cooling coils, heating coils, filters, humidifiers, fans, sound attenuators, controls, and other devices functioning to meet the needs of the structures. The air-handling system may be manufactured in a factory and brought to the structure to be installed or it may be built on site using the necessary devices to meet the functioning needs of the structure. The air-handling compartment 102 of the air-handling system includes the inlet plenum 112 prior to the fan inlet cone 104 and the discharge plenum 110. Within the air-handling compartment 102 is situated the fan unit 100 (shown in FIGS. 1 and 2 as an inlet cone 104, a fan 106, and a motor 108), fan frame, and any appurtenance associated with the function of the fan (e.g. dampers, controls, settling means, and associated cabinetry). Within the fan 106 is a fan wheel (not shown) having at least one blade. The fan wheel has a fan wheel diameter that is measured from one side of the outer periphery of the fan wheel to the opposite side of the outer periphery of the fan wheel. The dimensions of the handling compartment 102 such as height, width, and airway length are determined by consulting fan manufacturers data for the type of fan selected.--

Please replace the paragraph beginning at page 18, line 1, with the following rewritten paragraph:

-- The fan unit chambers 244 shown in FIG. 17 may include one or more ~~one ore more~~ interior surface made from or lined with an acoustically absorptive material or "insulation surface" 248. Going against conventional industry wisdom that surfaces cannot be placed in close proximity with the fan units 200, the present invention places one or more insulation surfaces 248 at least partially around each fan unit 200 without disrupting air flow. The insulation surfaces 248 may include one or more of the sides, top, bottom, front, or back. Exemplary types of insulation include, but are not limited to traditional insulation board (such as that made from inorganic glass fibers (fiberglass) alone or with a factory-applied foil-scrim-kraft (FSK) facing or a factory-applied all service jacket (ASJ)) or alternative insulation such as open cell foam such as that disclosed in U.S. Patent Application No.10/606,435, which is assigned to the assignee of the present invention, and which the disclosure of which is hereby incorporated by reference herein. Together, the insulation surfaces 248 on the fan unit chambers 244 tend to function as a coplanar silencer. Some of the benefits of using the coplanar silencer include (1) no added airway length for splitters, (2) no pressure drop, and/or (3) relatively low cost. The acoustic advantages of this and other embodiments make the present invention ideal for use in concert halls, lecture halls, performing arts centers, libraries, hospitals, and other applications that are acoustically sensitive.--

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A fan array fan section in an air-handling system comprising:

(a) at least ~~three~~ six fan units;

(b) said at least ~~three~~ six fan units arranged in a fan array;

(c) an air-handling compartment within which said fan array of fan units is positioned; and

(d) an array controller for controlling said at least ~~three~~ six fan units to run at substantially peak efficiency by strategically turning selective ones of said at least six fan units on and off.

Claim 2 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein said at least ~~three~~ six fan units are plenum fans.

Claim 3 (original): The fan array fan section in an air-handling system of claim 1, wherein said air-handling compartment has an airway path, said airway path being less than 72 inches.

Claim 4 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein said at least ~~three~~ six fan units are a plurality of fan units arranged in a fan array configuration selected from the group consisting of:

(a) a true array configuration;

(b) a spaced pattern array configuration;

(c) a checker board array configuration;

(d) rows slightly offset array configuration;

(e) columns slightly offset array configuration; and

(f) a staggered array configuration.

Claim 5 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein said at least ~~three~~ six fan units [[are plenum fans]] include at least two vertically arranged fan units.

Claim 6 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein each of said at least ~~three~~ six fan units is positioned within a fan unit chamber.

Claim 7 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein each of said at least ~~three~~ six fan units is suspended within a respective said fan unit chamber such that there is an air relief passage therebelow.

Claim 8 (currently amended): The fan array fan section in an air-handling system of claim 1, wherein each of said at least ~~three~~ six fan units is positioned within a fan unit chamber having at least one acoustically absorptive insulation surface.

Claim 9 (original): The fan array fan section in an air-handling system of claim 1, wherein each of said at least ~~three~~ six fan units are mounted in a grid system.

Claim 10 (original): The fan array fan section in an air-handling system of claim 1, wherein each of said at least ~~three~~ six fan units has a fan wheel diameter, wherein spacing between said at least ~~three~~ six fan units is less than 60% of said fan wheel diameter.

Claim 11 (currently amended): A fan array fan section in an air-handling system comprising:

(a) an air-handling compartment;

(b) a plurality of fan units;

(c) said plurality of fan units arranged in a fan array;

(d) said fan array having at least one fan unit arranged vertically on at least one other fan [[unit.]] unit;

(e) said fan array positioned within said air-handling compartment; and

(f) said air-handling compartment positionable within a structure such that said air-handling system conditions the air of said structure.

Claim 12 (currently amended): The fan array fan section in an air-handling system of claim 11 further comprising an array controller programmed to operate said plurality of fan units at peak efficiency by strategically turning on and off selective ones of said plurality of fan units.

Claim 13 (original): The fan array fan section in an air-handling system of claim 11, wherein said plurality of fan units are plenum fans.

Claim 14 (original): The fan array fan section in an air-handling system of claim 11, wherein said air-handling compartment has an airway path, said airway path being less than 72 inches.

Claim 15 (original): The fan array fan section in an air-handling system of claim 11, wherein said plurality of fan units are arranged in a fan array configuration selected from the group consisting of:

(a) a true array configuration;

(b) a spaced pattern array configuration;

(c) a checker board array configuration;

(d) rows slightly offset array configuration;

(e) columns slightly offset array configuration; and

(f) a staggered array configuration.

Claim 16 (original): The fan array fan section in an air-handling system of claim 11, wherein each of said plurality of fan units is positioned within a fan unit chamber.

Claim 17 (currently amended): The fan array fan section in an air-handling system of claim 11, wherein each of said plurality of fan units is suspended within a respective said fan unit chamber such that there is an air relief passage therebelow.

Claim 18 (currently amended): The fan array fan section in an air-handling system of claim 11, wherein each of said plurality of fan units is positioned within a fan unit chamber having at least one acoustically absorptive insulation surface.

Claim 19 (original): The fan array fan section in an air-handling system of claim 11, wherein each of said plurality of fan units is mounted in a grid system.

Claim 20 (original): The fan array fan section in an air-handling system of claim 11, wherein each of said plurality of fan units has a fan wheel diameter, wherein spacing between said plurality of fan units is less than 60% of said fan wheel diameter.

Claim 21 (new): The fan array fan section in an air-handling system of claim 1, further comprising an array of backdraft dampeners, each backdraft dampener in line with a respective fan unit.

Claim 22 (new): The fan array fan section in an air-handling system of claim 11, further comprising an array of backdraft dampeners, each backdraft dampener in line with a respective fan unit.

Claim 23 (new): The fan array fan section in an air-handling system of claim 1, wherein each fan unit has a peak efficiency operating range outside of which it operates at a reduced efficiency, wherein said array controller is programmed to operate said at least six fan units at substantially peak efficiency by strategically turning off at least one fain unit operating at reduced efficiency and running the remaining fan units within said peak efficiency operating range.

Claim 24 (new): The fan array fan section in an air-handling system of claim 11, further comprising an array controller, wherein each fan unit has a peak efficiency operating range outside of which it operates at a reduced efficiency, wherein said array controller is programmed to operate said plurality of fan units at substantially peak efficiency by strategically turning off at least one fain unit operating at reduced efficiency and running the remaining fan units within said peak efficiency operating range.

Claim 25 (new): The fan array fan section in an air-handling system of claim 1, said array controller is programmed to operate said at least six fan units at peak efficiency for a performance level based on a criteria selected from the following group of criteria:

(a) air volume;
(b) level of air flow;
(c) pattern of air flow; and
(d) number of fan units to operate.

Claim 26 (new): The fan array fan section in an air-handling system of claim 11, further comprising an array controller for controlling said plurality of fan units to run at substantially peak efficiency by strategically turning selective ones of said plurality of fan units on and off, said array controller programmed to operate said plurality of fan units at peak efficiency for a performance level based on a criteria selected from the following group of criteria:

(a) air volume;

(b) level of air flow;

(c) pattern of air flow; and

(d) number of fan units to operate.

Claim 27 (new): The fan array fan section in an air-handling system of claim 1, said array controller is programmed to operate said at least six fan units to produce a stable operating point and eliminate the surge effects.

Claim 28 (new): The fan array fan section in an air-handling system of claim 11, further comprising an array controller for controlling said plurality of fan units, said array controller is programmed to operate said plurality of fan units to produce a stable operating point and eliminate the surge effects.

Claim 29 (new): The fan array fan section in an air-handling system of claim 1, said array controller is programmed to selectively control the speed of each of said at least six fan units to run at substantially peak efficiency.

Claim 30 (new): The fan array fan section in an air-handling system of claim 11, further comprising an array controller for controlling said plurality of fan units, said array controller is programmed to selectively control the speed of each of said plurality of fan units to run at substantially peak efficiency.

Claim 31 (new): The fan array fan section in an air-handling system of claim 1, said air-handling compartment positionable within a structure such that said air-handling system conditions the air of said structure.

REMARKS

Claims 1-31 are pending in the application after this amendment. The amendment and/or addition of claims is not to be considered in any way an indication of applicant's position on the merits of the amended and/or added claims. In the following sections of the Amendment the rejections set forth by the Examiner in the September 15, 2004, Office action are addressed. These rejections are respectfully traversed, and detailed arguments are set forth below.

A preliminary matter, the specification has been amended to correct a minor grammatical error. It is submitted that this amendment should not be objectionable.

Also as a preliminary matter, applicant submits herewith an Information Disclosure Statement (IDS) and references of which applicant was recently made aware. Applicant respectfully requests that the references set forth on the IDS be considered and acknowledged.

The Examiner rejected claims 1-20 under 35 USC §102(b) as being anticipated by U.S. Patent No. 4,767,262 to Simon (the "Simon reference"). Applicant has also reviewed U.S. Patent No. 6,072,397 to Ostrowski and U.S. Patent No. 5,370,576 to Krofchalk. None of these cited references is directed to a fan array fan section in an air-handling system as defined in the specification of the present application. (See page 2 of the original specification. "An air-handling system is defined as a system that includes components designed to work together in order to condition air as part of the primary system for ventilation of structures." Structures are defined in the specification as buildings or rooms.) Applicant would like to note that he considers these references nonanalogous as the issues relating to fans for computer systems or small electrical appliances operate under completely different principles than those applicable to air-handling systems. Issues that are significant to air-handling systems are non-issues in fans for computer systems or small electrical appliances. For example, the quantity of air and the weight of the fan units are non-issues in fans for

computer systems or small electrical appliances, but are significant to air-handling systems. Another non-issue in fans for computer systems or small electrical appliances that is significant to air-handling systems is the control over air delivery rates to meet varying demands under varying pressure loads and the controlling of the fan array to achieve optimum efficiency by selectively turning fans off or on to meet system diversity caused by filter loading and/or cooling requirements related to the process or external environment.

The references provided with the enclosed IDS (the "IDS references") may teach an air-handling compartment within which an fan array of fan units may be positioned. Applicant specifically does not admit that the IDS references are prior art. However, for the purpose of furthering prosecution applicant will address the IDS references as though they are prior art. The IDS references disclose the RL Series Rooftop Conditioners produced by AAON, Inc. A rooftop conditioner has different requirements than an air-handling compartment that is positionable within a structure. For example, whereas a rooftop conditioner is primarily concerned with structure-borne sound, airborne sound is not a significant concern. The spring mounting of the assembly, for example, is an attempt to reduce structure borne sound. It should be noted that the IDS references also do not teach or suggest other claimed elements which are addressed below in discussions of the individual claims.

Applicant would like to remind the Examiner that there are many reasons why the combination of the IDS references and a nonanalogous reference such as the Simon reference would be improper. For example, the mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no teaching in either reference that such a combination is desirable. Further, although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Fritch*, 972 F.2d at 682, 16 USPQ2d at 1432.) There is no suggestion or motivation in either reference to do so. Still further,

the fact that the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish *prima facie* obviousness. Finally, the proposed modification cannot render the prior art unsatisfactory for its intended purpose (MPEP 2143.01). The IDS references would not be able to function properly if the Simon half-shell casings were used to support the IDS reference fan units because the Simon material (talc-reinforced polypropylene) would simply not be able to support the weight of the IDS reference fan units nor would the use of talc-reinforced polypropylene in any capacity in the vicinity of the fan result in a reduction in fan sound levels.

The following paragraphs are directed to specific claims. Dependent claims not specifically addressed are allowable for the same reason as discussed for their respective independent claims as well as for the limitations contained therein.

Claim 1 and the claims dependent thereon have been amended to specifically recite "at least six fan units." As set forth in the enclosed DECLARATION OF LAWRENCE G. HOPKINS, a system having six or more fans has unique properties that are not present in systems having less fans and it would not have been obvious to increase the number of fans. The substantially improved results would have been unexpected to one skilled in the art.

Claims 1 and 12 specifically recite an array controller programmed to operate the fan units at peak efficiency. The Simon reference teaches two ways to control the fans. First, the user can manually control the number of fans by inserting and connecting the desired number of fans. (Column 3, lines 21-23.) Second, an electric control block can supply a control voltage to the number of fans provided in the fan slide in unit to control the speed of the fans. (Column 3, lines 24-33.) In other words, the Simon reference allows no air to be supplied by manually removing or disconnecting the fan. Otherwise, all the fans are controlled by a single control voltage, that can be varied, but it runs all the fans at the same speed. At lower speeds, the fans would be inefficient. The IDS references appear to recognize that fan units may be taken off-line (e.g. for maintenance). However, these references do not appear to teach or suggest any means by which a controller can operate said plurality of fan units at

peak efficiency by strategically turning on and off selective ones of said plurality of fan units.

Claims 11 and 31 specifically recite an air-handling compartment positionable within a structure such that said air-handling system conditions the air of said structure. The references cited by the examiner do not teach or suggest this limitation because they do not condition the air of the structure. For purposes of argument only and without making such an admission, if the PC casing is equivalent to the air-handling compartment, then the room or building in which the PC casing is positioned must be the structure, but the "air-handling system" inside the PC casing does not condition the air of the structure. The IDS references also do not teach or suggest such a system positionable within a structure, but specify that their systems are positionable on the rooftop, above a structure.

Claims 3 and 14 specifically recite an airway path being less than 72 inches. The IDS references do not teach or suggest a shortened airway path. The IDS references disclose airway paths between 75.5 inches and 90 inches. The AAON references to not teach or suggest that the airway paths could be shortened or that there is any desirability to do so. In a system that is internal to a structure, because real estate (e.g. structure space) is extremely expensive, a larger size air-handling compartment is extremely undesirable. Using the present invention, reducing the size of the fan unit and motor reduces the length of the discharge plenum. Similarly, reducing the size of the inlet cone reduces the length of the inlet plenum. The length of the discharge plenum can also be reduced because air from the fan array fan section in the air-handling system of the present invention is substantially uniform whereas the prior art air-handling system has points of higher air velocity and needs time and space to mix so that the flow is uniform by the time it exits the air-handling compartment. The fan array fan section in the air-handling system takes in air from the inlet plenum more evenly and efficiently than the prior art air-handling system so that the length of the inlet plenum may be reduced.

Claims 8 and 18 specifically recite that the fan unit chambers have at least one acoustically absorptive insulation surface. As set forth in the original specification, this goes against conventional industry wisdom that surfaces cannot be placed in close proximity with the fan units without disrupting air flow. In the September 15, 2004 Office action the Examiner sites column 2, lines 26-38 of the Simon reference as teaching insulation. Applicant has reviewed this reference carefully and believes that there is a distinction between the material from which the Simon half-shell casings are constructed and the acoustically absorptive insulation surface(s) of the presently claimed invention. Applicant believes that the Simon material must be rigid. This belief is based on the fact that the Simon half-shell casings must support the weight of the individual fans and the fact that the suggested material (talc-reinforced polypropylene) is rigid material. As a rigid material, the Simon material would not be an acoustically absorptive material (insulation material). Applicant believes that the noise that the Simon material would absorb would be structure-borne noise – not airborne noise. None of the IDS references teach or suggest the use of acoustically absorptive insulation to effectively attenuate air-borne noise. The insulation used in the IDS references is thermal insulation and is only placed on the exterior surface of the air-handling compartment.

Claims 10 and 20 specifically recite the spacing between the fan units being less than 60% of the fan wheel diameter. The IDS references do not teach or suggest such spacing.

Claims 23 and 24 specifically recite that the array controller is programmed to operate the fan units at substantially peak efficiency by strategically turning off at least one fain unit operating at reduced efficiency and running the remaining fan units within peak efficiency operating range. This feature is not taught or suggested by any of the known references.

New claims 25 and 26 specifically recite that the array controller is programmed to operate the six fan units at peak efficiency for a performance level

based air volume, level of air flow, pattern of air flow, or number of fan units to operate. This feature is not taught or suggested by any of the known references.

New claims 27 and 28 specifically recite that the array controller is programmed to operate the fan units to produce a stable operating point and eliminate the surge effects. This feature is not taught or suggested by any of the known references.

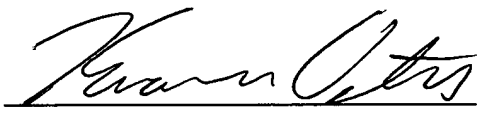
New claims 29 and 30 specifically recite that the array controller is programmed to selectively control the speed of each of the fan units to run at substantially peak efficiency. This feature is not taught or suggested by any of the known references.

In view of the above, it is submitted that the currently pending claims are patentable. Accordingly, the Examiner is requested to reexamine the application, to allow the claims, and to pass the application on promptly to issue.

A Petition for Extension of Time for Three months is enclosed herewith.

Please charge Deposit Account No. 50-2115 for any additional fees that may be required.

Respectfully submitted,



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Of Attorneys of Record
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PTO/SB/21 (09-04)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/806,775
Filing Date	March 22, 2004
First Named Inventor	Hopkins
Art Unit	3745
Examiner Name	Nguyen, Ninh H.
Attorney Docket Number	Hunt:FanArr1

ENCLOSURES *(Check all that apply)*

- [X] Fee Transmittal Form in duplicate
- [X] Fee Attached
- [X] Amendment/Reply
  - [ ] After Final
  - [X] Affidavits/declaration(s)
- [X] Extension of Time Request
- [ ] Express Abandonment Request
- [X] Information Disclosure Statement PTO/SB/08b, and attached non-patent references
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [X] Other Enclosure(s) (please Identify below):

see remarks

Remarks

return receipt postcard

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Law Office of Karen Dana Oster, LLC		
Signature	Karen Oster		
Printed name	Karen Dana Oster		
Date	March 15, 2005	Reg. No.	37,621

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Karen Oster		
Typed or printed name	Karen Dana Oster	Date	March 15, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL For FY 2005

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 965

Complete if Known	
Application Number	10/806,775
Filing Date	March 22, 2004
First Named Inventor	Hopkins
Examiner Name	Nguyen, Ninh H.
Art Unit	3745
Attorney Docket No.	Hunt:FanArr1

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 50-2115 Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	0
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
31 - 20 or HP =	11	x 25	= 275

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
2 - 3 or HP =	0	x 100	= 0

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
- 100 =	/ 50 =	0 (round up to a whole number)	x 125	= 0

4. OTHER FEE(S)

	Fees Paid ($)
Submission of an Information Disclosure Statement	180
Three Month Extension Fee	510

SUBMITTED BY

Signature	Karen Oster	Registration No. (Attorney/Agent) 37,621	Telephone (503) 810-2560
Name (Print/Type)	Karen Dana Oster		Date March 15, 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2005** *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) Hunt:FanArr1
Application Number 10/806,775	Filed March 22, 2004
For Fan Array Fan Section in Air-Handling Systems	
Art Unit 3745	Examiner Nguyen, Ninh H.

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$120	$60	$
☐	Two months (37 CFR 1.17(a)(2))	$450	$225	$
☒	Three months (37 CFR 1.17(a)(3))	$1020	$510	$ 510
☐	Four months (37 CFR 1.17(a)(4))	$1590	$795	$
☐	Five months (37 CFR 1.17(a)(5))	$2160	$1080	$

☒ Applicant claims small entity status. See 37 CFR 1.27.

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-2115. I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ attorney or agent of record. Registration Number 37,621

☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Signature — March 15, 2005 (Date)

Karen Dana Oster (Typed or printed name) — (503) 810-2560 (Telephone Number)

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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DECLARATION OF LAWRENCE G. HOPKINS
March 15, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION EXAMINING OPERATIONS

Applicant:	Hopkins	Group Art Unit:	3745
Serial No.:	10/806,775	Examiner:	Nguyen, Ninh H.
Filed:	March 22, 2004	Docket No:	Hunt:FanArr1
Title:	Fan Array Fan Section in Air-Handling Systems		

DECLARATION OF LAWRENCE G. HOPKINS
UNDER 37 CFR SEC. 1.132

Law Office of Karen Dana Oster, LLC
PMB 1020
15450 SW Boones Ferry Rd. #9
Lake Oswego, OR 97035
March 15, 2005

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Lawrence G. Hopkins, hereby declare as follows:

1. I am an engineer specializing in the fields of fan design, acoustics, vibration, and aerodynamics with particular emphasis in commercial and industrial air handler and ventilation equipment. I received a Bachelors of Science degree in mechanical engineering from The University of Portland in 1975 and became a registered engineer in the State of Oregon in 1982. I have 30 years experience in the fields of acoustics and vibration and 19 years experience in fan and air handling system design. I have worked in the industry in various capacities over the years ranging from engineer to engineering director for three multinational corporations. I directed the construction of two AMCA (Air Movement and Control Association) test facilities each designed and dedicated to the measurement and quantification of fan performance in the areas of air flow rate, consumed power, pressure, efficiency, vibration, sound, and

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structural integrity. I am a member of the Institute of Environmental Engineers, Acoustical Society of America and the American Society of Heating Ventilation Engineers.

2. In 2002, I conceived initial embodiments of the present Fan Array Fan Section in Air-Handling Systems invention as a means of providing a fan system with features and benefits far exceeding present technology. The unique array and controller have also had substantially improved results over prior art devices (such as the AAON device) that would have been unexpected to one skilled in the art. The fan array outperforms current technology by a) demonstrating lower energy consumption for a given air delivery requirement, b) increasing system efficiency under steady and diversified loads, c) increasing system reliability to n+1 or greater redundancy, and d) significantly lowering noise levels.

a) The fan array outperforms traditional systems by allowing air entering or leaving the fan section to do so in a laminar manner thus eliminating stratification on upstream and downstream elements. Upstream and downstream elements may include filters, cooling and heating coils, sound attenuators, and humidification racks. Laminar air flow not only improves the efficiency of the individual devices but reduces pressure drop which reduces fan load and consumed power. In many traditional systems, settling means are installed between the inlet and discharge of the fan and surrounding elements to emulate laminar air flow. The settling means adds pressure drop to the system and causes power consumption to increase for a given air delivery requirement.

b) A fan array lowers energy consumption by allowing the designer to tailor the fan system output to the actual operating point of the process. It is general practice that all fan systems are designed for a worst case scenario. The worst case scenario is based on the greatest demand period which is a combination of coldest or warmest day of the year and loading parameters for filters and coils. It also includes safety factors applied to the design by the design engineer. The result is that nearly every air handler manufactured specified, manufactured, and put into service is over-designed for the normal operating condition. The excess design factors can be as high as 30% to 40% resulting in air handling systems that run at reduced efficiency. Fans

and motors are most efficient at one load point at a given speed. Motors are most efficient when nearly fully loaded. The fan wall allows the operator to turn off fans when they are not needed thus maintaining optimal motor efficiency and lower power consumption.

c) Unlike traditional air handler systems that require a complete shutdown to repair a motor failure, the fan array of the present invention is designed to operate and maintain system air with one or more motors off and to allow replacement of the damaged motor without turning the air handler off. This "hot repair" feature is unique to the fan array of the present invention and has proven to be exceedingly valuable to institutions or processes requiring stable delivery of conditioned air. Such industries include hospitals, semiconductor manufacturing plants, and pharmaceutical plants. A failure in the air handling system in process critical systems can result in loss of process control and reduced yield. A fan failure in a critical care facility may require evacuation or rescheduling of facility usage such as would occur for surgery units or areas mandating air delivery as a condition of occupancy. For highly critical spaces it is general practice to install two complete air handlers or install two complete fan systems in order to create what is known as n+1 redundancy. This is not the case with the fan array technology since any member of the fan array can repaired without disruption to the fan system as a whole. This provides 100% assurance that the system will remain stable and not affect critical functions.

d) Fan systems generate higher sound levels when operating at other than peak efficiency. Since the efficiency of the fan array of the present invention can be optimized for a larger range of operating points, the array will produce significantly lower sound levels than traditional systems. This coupled with close fitting insulation elements enables the fan array to outperform traditional systems by as much as 16 dB in the 63, 125, and 250 Hz octave bands. Equivalent reductions in traditional systems would necessitate the use of 7 to 10 foot long sound attenuators each causing a system pressure load and higher power consumption. In many cases the fan array can operate without the need for additional sound attenuation or corresponding pressure requirement.

3. Between my conception and March 20, 2003 (my priority filing date), I was actively involved in testing and development of the product including developing various embodiments thereof. The claimed invention was not patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the priority date.

4. I have reviewed the references submitted concurrently herewith in my INFORMATION DISCLOSURE STATEMENT. These references will be discussed jointly as the "AAON references." The AAON references disclose a fan system (AAON RL Series air handlers) having up to four fans. For the AAON RL Series air handlers, AAON allows the customer/designer to select from 1 to 4 supply fans ranging in size from 27" to 42.5" in diameter and return fans from 36" to 48" in diameter. AAON offers five unit sizes with pre-designed cabinet dimensions. The fan section length for any size or capacity offered is set at a predetermined length regardless of number of fans or fan size. Dimensional drawings included in the AAON application manual show the airway length for the fan section to be a minimum of 75.5" long to 90" long depending on the model.

5. As compared to the AAON RL Series air handlers, the fan array of my invention is based on using a larger quantity of smaller fans to compress the airway length and reduce overall unit size. The AAON application literature and accompanying software prohibit the customer/designer from selecting smaller fans for the purpose of compressing airway length. Because the AAON references teach against the use of smaller fans, it would not be obvious to one skilled in the art to attempt to scale the fan array for the purpose of saving cabinet length and corresponding real estate within the occupied building.

6. The AAON references do not teach or suggest my claimed use of "six fan units." The AAON references disclose the use of one fan unit, two fan units, three fan units, or four fan units (including a 2x2 array of fan units). Nowhere in the AAON references is there any teaching or suggestion that more fan units are contemplated and I have no knowledge of the use of more than the four fan units by anyone in the industry until after my priority date.

7. It is also clear that AAON did not recognize any benefit to increasing the number of fans to six or greater for the purpose of fine tuning the output or achieving higher efficiencies or creating redundancy or incorporating sound attenuating elements. In the AAON design, if one fan motor fails the air flow rate is reduced a minimum of 25%. In the example AAON job provided there are four supply fans each fitted with 25 horsepower motors (19.98 HP required at the operating point) operating at 1580 RPM producing 52,000 cfm. If one fan is turned off or fails, the new maximum flow rate for the unit is determined by speeding the remaining motors up to the maximum motor horsepower. The new maximum flow rate is 47,073 cfm at 1679 rpm at the maximum available power of 25 brake horsepower. Further, the AAON manual forces the user to pick motors based on fan size and duty that will not allow the system to maintain or recover air flow in the event of a motor failure. The AAON system static efficiency at full flow with four fans operating is 67.32% whereas a nine fan array can be configured to run at 72.4% static efficiency using 10 HP motors. Further the nine fan array can be configured to operate with eight fans while maintaining 52,000 cfm at the required pressure of 6.57" tsp while consuming 9.3 brake horsepower at 72.2% static efficiency. Even though one fan is off, the remaining eight fan array will maintain design flow rates while an AAON system with one fan off cannot maintain design flow rates (they actually drop in flow as they overload the motors). It is particularly interesting to note that Cleanpak, along with many other Huntair competitors, went on record criticizing my fan array as something "that would not work." Various publications emerged that contained language raising doubt as to the viability of a fan array. These publications would be available upon request.

8. The AAON references do not teach or suggest my claimed "array controller" for controlling the fan units "to run at substantially peak efficiency by strategically turning selective ones of said at least nine fan units on and off." The AAON references use an array controller that is limited to operating four fans over a limited range. The size of fans available and limited resolution in terms of each fan contribution prohibit the AAON system from functioning in a manner to capture the benefits of the claimed invention. Changes to the AAON array controller scheme or number of fans will

not achieve the same benefits as the claimed fan array. Therefore it would not be obvious to attempt a modification to the controller or fan design to achieve peak efficiency, nor would it be obvious to expect the fan array in the AAON design to function to maintain set flow rates in the event of a fan motor failure or to be able to achieve peak efficiency at with fewer fans.

9. The unique array and controller have solved an unsolved need of a fan system that can be optimized over a wide variety of conditions while offering unprecedented reliability and ease of maintenance. The fan array, by virtue of a reduced airway length, enables building owners to decrease the size of the equipment mechanical room and achieve more usable space or not over build mechanical space to accommodate large air handling systems. The fan array, because of its smaller size, saves on nonrenewable resources such as steel, insulation materials, and energy.

10. In large part because of my unique array and controller, Huntair (the assignee of the present application) has had significant commercial success as is shown in the accompanying power point presentation (Appendix A) and attached specification sheets taken from recent projects (Appendices B-D). The three specification sheets show three projects (out of many) that specify the Huntair fan array as the only allowed fan system. The three referenced projects include; The Sacramento LDS Temple in California (Appendix B), the Faribault Middle School in Minnesota (Appendix C), and the Phoenix Symphony Hall Renovation Project in Arizona (Appendix D). Each of these specifications explicit specify the Huntair Fan Wall Array as the only acceptable fan system for the project. More examples of sole sourcing the fan array are available on request. A further example of the popularity of the fan array is in critical process facilities such as the new Intel Fab 24.2 expansion in Ireland. Intel expedited a white paper to enable the fan array concept to be used on the new expansion. In this example the fan array was built and tested to show a reduced power consumption of 50% over the traditional system employed in phase 1. In a further example of the popularity of the fan array, Legacy Hospital reduced the number of air handlers from two to one by selecting the Huntair fan array.

11. I also have specific knowledge that Huntair's competitors are copying my unique array and controller. For example, Cleanpak International copied the fan array and presented concepts and designs to Intel on a recent data center project in Oregon. Cleanpak was ultimately awarded a contract based on price and a fan array that is identical to my fan array. A Technical Bulletin showing evidence of copying is attached as Appendix E. Additional evidence of copying was submitted along with the Petition to Make Special.

I further declare that all statements made herein are of my own knowledge, are true, and that all statements made on information and belief are believed to the true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: March 15, 2005

Lawrence G. Hopkins

Appendix B

1. . an Wall Technology (FWT)
   a. The Fan Wall Array, as manufactured by Huntair Inc., shall consist of multiple, direct driven, arrangement 4 plenum fans constructed per AMCA requirements for the duty specified, (Class II,). All fans shall be selected to the design air flow at the specified operating TSP at synchronous motor speed as specified and scheduled. The Fan Wall Array shall be selected to operate at a system Total Static Pressure that does not exceed 90% of the specified fan cartridge peak static pressure producing capability. Each fan/motor cartridge shall consist of an 11 gauge A60 galvanized steel intake wall, 14 gauge spun steel inlet tunnel, and 11 gauge A60 galvanized steel motor support plate and structure. The fan cartridge intake wall, inlet funnel fan wheel, and motor support structure shall be powder coated. All motors shall be standard T-frame motors selected at the specified operating voltage and RPM, and efficiency as specified elsewhere. Entire assembled fan/motor cartridge shall not exceed 165 lbs in total weight unless otherwise specified. Each fan/motor cartridge shall be dynamically balanced to meet AMCA standard 204-96, category BV-5, Grade 1.0 with peak to peak deflection equal to or less than .5 mil at the design operating speed for the fan/motor cartridge.
   b. The fan array shall consist of multiple fan/motor "cartridges", spaced in the air way tunnel cross section to provide a uniform air flow and velocity profile across the entire air way tunnel cross section and components contained therein. Each fan cartridge shall be individually factory wired to a factory installed control panel containing two VFDs, sized for the total connected HP for the Fan Wall Array. Wire sizing shall be determined in accordance with NEC standards. Control panel shall be factory installed on the air handling unit with single point power connection.
   c. The Fan Wall array shall produce a uniform air flow profile and velocity not to exceed the specified cooling coil and/or filter bank face velocity when measured at a point 12" from the intake side of the Fan Wall array septum wall, and at a distance of 42" from the discharge side of the Fan Wall array septum wall.
   d. Each fan/motor cartridge shall be removable through a 30" wide access door located on the discharge side of the fan wall array.
   e. The manufacture shall provide a complete spare FWT fan/motor cartridge for emergency replacement, one for each type of assembly provided on the project.
   f. Individual fans shall not exceed 0.025" per second at the rotational speed of the wheel. Further the sum of all the fans shall not exceed 0.025" per second measured at the fan section base.
   g. Furnish with factory installed straightening grid, coplanar silencer on outlet side of fan, and outlet gravity backdraft damper at each fan.
   h. Furnish each fan with "flow-cone" airflow measuring with digital read out display showing total of all fan CFMs. Digital read out shall be factory wired. Locate display in the face of the unit mounted control panel.

C. Motors
   1. Fan motors as specified in Section 15055. Premium efficiency, inverty duty. Match motor with variable frequency drive. All motor bearings shall be electrically isolated from the motor housing.

D. Coils
   1. Provided by same company as supplier of air handling units and designed with aluminum plate fins and copper tubes, with stainless steel casings.
   2. Fins shall have collars drawn, belled, and firmly bonded to tubes with mechanical expansion of tubes. Fins shall be minimum 0.01" sheet thickness.
      a. Soldering or tinning shall not be used in bonding process.
      b. Mount coils in unit casing to be accessible for service and can be removed from unit through side or top.
      c. Capacities, pressure drops, and selection procedure shall be certified in

Appendix C

size and location where shown on plans. An ETL rated fan access door latch shall be installed on all fan modules. Access handles shall accept a lock.

8. Condensate Drain Pans: Formed sections of stainless-steel sheet or galvanized steel coated with microbial resistant Fosters 40-60 or equal product complying with requirements in ASHRAE 62. The entire drain pan shall be insulated under the entire coil section as wee as coil headers. The entire drain pan shall be visible for downstream inspection. Provide a drain a minimum centerline of 3" above the base rail.
9. Units with stacked coils shall have an intermediate drain pan or drain trough to collect condensate from top coil.

2.3 FAN WALL SECTION

A. The Fan Wall System, as manufactured by Huntair Inc., shall consist of multiple, direct driven, arrangement 4 plenum fans constructed per AMCA requirements for the duty specified. All fans shall be selected to deliver the specified airflow quantity at the specified operating Total Static Pressure and specified fan/motor speed. The Fan Wall Array shall be selected to operate at a system Total Static Pressure that does not exceed 90% of the specified fan's peak static pressure producing capability at the specified fan/motor speed.

B. Each fan/motor cube shall include an 11 gauge, A60 Galvanized steel intake wall, 14 gauge spun steel fan inlet funnel, and an fully welded structural steel angle iron frame designed to support a pedestal mounted arrangement 4 direct drive fan/motor assembly.

C. The fan intake wall, inlet funnel, and motor support structure shall be powder coated for superior corrosion resistance.

D. All motors shall be standard pedestal mounted type, ODP, T-frame motors selected at the specified operating voltage, RPM, and efficiency as specified or as scheduled elsewhere. All motors shall include isolated bearings or shaft grounding. Each fan/motor cartridge shall be dynamically balanced to meet AMCA standard 204-96, category BV-5, to meet or exceed Grade 2.5 residual unbalance.

E. The FWT array shall be provided with coplanar acoustical silencers that reduce the bare fan discharge sound power levels by a minimum of 15 db re 10^-12 watts throughout the eight octave bands with center frequencies of 125, 250, 500, 1000, 2000, 4000, and 8000 HZ when compared to the same unit without the silencers. The silencers shall not increase the fan total static pressure, nor shall it increase the airway tunnel length of the Air Handling Unit when compared to the same FWT unit without the silencer array.

F. Manufacturer must submit acoustical data for review and approval prior to the bid indicating that the proposed equipment can meet all specified performance requirements without impacting the equipment performance or design features including duct connection location, unit weights, acoustical performance, or specified total fan HP for each FWT array. Proposals submitted which indicate a higher connected fan HP than specified or scheduled will not be accepted.

G. The fan array shall consist of multiple fan and motor "cubes", spaced in the air way tunnel cross section to provide a uniform air flow and velocity profile across the entire air way tunnel cross section and components contained therein. Each fan cube shall be individually wired to a control panel containing a single VFD, as specified elsewhere, for the total connected HP for all

2 cont'd.

fan motors contained in the FWT array. Wire sizing shall be determined, and installed, in accordance with applicable NEC standards.

H. The Fan Wall array shall produce a uniform air flow profile and velocity profile within the airway tunnel of the air handling unit not to exceed the specified cooling coil and/or filter bank face velocity when measured at a point 12" from the intake side of the Fan Wall array intake plenum wall, and at a distance of 48" from the discharge side of the Fan Wall intake plenum wall.

I. Each fan/motor assembly shall be removable through a 30" wide, free area, access door located on the discharge side of the fan wall array.

2.4 MOTORS

A. General: Premium Efficiency Inverter Duty Rated for variable speed operation and to comply with requirements in Division 15 Section "Motors."

B. Noise Rating: Very Quiet.

2.5 COILS

A. Coil Sections: Common or individual, insulated, galvanized-steel casings for coils. Design and construct to facilitate removal and replacement of coil for maintenance and to ensure full airflow through coils. Provide access from both sides of coil.

B. Water Coils: Coils shall be fully drainable and cleanable. Coils shall be ARI 410 certified and UL listed.
1. Piping Connections: Threaded on same end. Connections shall be on the side shown on the drawings.
2. Tubes: Tubes shall be 5/8" outer diameter, minimum of .020" thick brazed seamless copper on 1-1/2" centers, staggered in the direction of airflow. Tubes shall be mechanically expanded into the fins to provide continuous primary to secondary compression bond over the entire finned length to maximize heat transfer. Bare copper tubes shall not be visible between fins.
3. Fins: Aluminum plate construction with a minimum thickness of 0.0075 inch and shall not have more than 12 fins per inch. Fins shall have full drawn collars to provide continuous surface to cover over the entire tube for maximum heat transfer.
4. Headers: Headers shall be seamless copper tubing with intruded tube holes that permit expansion and contraction without undue stress or strain. Headers to be fully inclosed with in the unit casing.
5. Venting: Coils shall have factory vent connections at the highest point. Drain connections shall be provided at the lowest point.
6. Provide airtight grommets to avoid casing leakage and comply with ASHRAE indoor air quality standards.

2.6 DAMPERS

A. General: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2 percent of air quantity at 2000-fpm face velocity through damper and 4-inch wg pressure differential.

Appendix D

1. As shown, Refer to Detail drawings:

D. Condensate Drain Pans: Formed sections of stainless-steel sheet complying with requirements in ASHRAE 62. Fabricate pans with slopes in two planes to collect condensate from cooling coils (including coil piping connections and return bends) when units are operating at maximum catalogued face velocity across cooling coil.

1. Double-Wall Construction: Fill space between walls with foam insulation and seal moisture tight.
2. Drain Connections: Both ends of pan.
3. Pan-Top Surface Coating: Elastomeric compound.
4. Units with stacked coils shall have an intermediate drain pan or drain trough to collect condensate from top coil.

2.4 FAN SECTION

A. Fan-Section Construction: Direct-drive axial fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and support structure and equipped with formed-steel channel base for integral mounting of fan, motor, and casing panels. Mount fan with vibration isolation.

B. Centrifugal Fan Housings: Spun-metal inlet bell, and access doors or panels to allow entry to internal parts and components.

1. Panel Bracing: Steel angle- or channel-iron member supports for mounting and supporting wheel, motor, and accessories.
2. Performance Class: AMCA 99-2408, Class I or II or III.
3. Plug Fans: With steel cabinet. Fabricate without fan scroll and volute housing.

C. Fan Assemblies:

1. The fan system shall consist of multiple, direct driven, arrangement 4, plenum fans constructed per AMCA requirements for the duty specified, (Class I, II, or III). All fans shall be selected to deliver the specified airflow quantity at the specified operating Total Static Pressure and specified fan/motor speed. The Fan Wall Array shall be selected to operate at a system Total Static Pressure that does not exceed 90% of the specified fan's peak static pressure producing capability at the specified fan/motor speed. Each fan/motor "cube" shall include an 11 gauge, A60 Galvanized steel intake wall, 14 gauge spun steel inlet funnel, and an 11 gauge G90 Galvanized steel motor support plate and structure. The fan intake wall, inlet funnel, and motor support structure shall be powder coated for superior corrosion resistance. All motors shall be standard pedestal mounted type, TEFC T-frame motors selected at the specified operating voltage, RPM, and efficiency as specified or as scheduled elsewhere. All motors shall include isolated bearings or shaft grounding. Each fan/motor cartridge shall be dynamically balanced to meet AMCA standard 204-96, category BV-5, to meet or exceed Grade 2.5 residual unbalance.
2. The Fan Wall Array shall be provided with acoustical silencers that reduce the bare fan discharge sound power levels by a minimum of 15 db re 10^-12 watts throughout the eight octave bands with center frequencies of 125, 250, 500, 1000, 2000, 4000, and 8000 Hz when compared to the same unit without the silencers. The silencers shall not increase

the fan total static pressure, nor shall it increase the airway tunnel length of the Air Handling Unit when compared to the details shown on the drawings.

3. Alternate manufacturers must submit acoustical data for review and approval prior to the bid indicating that the proposed alternate equipment performance or design features including duct connection location, unit weights, acoustical performance, or specified total fan HP.
4. The fan array shall consist of multiple fan and motor "cubes", spaced in the air way tunnel cross section to provide a uniform air flow and velocity profile across the entire air way tunnel cross section and components contained therein. Each fan cube shall be individually wired to a control panel containing a single VFD, as specified elsewhere, for the total connected HP for all fan motors contained in the fan wall array. Wire sizing shall be determined, and installed, in accordance with applicable NEC standards.
5. The fan wall array shall produce a uniform air flow profile and velocity profile within the airway tunnel of the air handling unit not to exceed the specified cooling coil and/or filter bank face velocity when measured at a point 12" from the intake side of the fan wall array intake plenum wall, and a distance of 48" from the discharge side of the fan wall intake plenum wall.
6. Each fan/motor assembly shall be removable through a 30" wide, free area, access door located on the inlet side of the fan wall array.
7. Each fan assembly shall be supplied with a complete flow measuring system, which indicates airflow in Cubic Feet per Minute. The flow measuring system shall consist of a flow measuring station with four static pressure taps and four total pressure tubes located at the throat of the fan inlet cone. The flow measuring station shall not obstruct the inlet of the fan and shall have no effect on fan performance (flow or static) or sound power levels. A surface mounted indicator, located on the unit exterior, shall provide a digital CFM readout, and a 4-20 mA output control signal for use in the BAS as specified elsewhere.
8. The manufacturer shall provide a complete spare fan/motor assembly for emergency replacement, one for each type of assembly provided on the project. Manufacturers for alternate, single direct driven fan assembly provided in lieu of the specified fan wall shall provide a spare motor and fan assembly and a five year, parts and labor warranty for repair and/or replacement at no additional expense to the owner. Such warranty coverage shall include all freight charges for expedited shipment of emergency replacement parts, the cost of any cranes or lifting devices, and any costs associated with air handling unit disassembly and re-assembly, as required, for emergency replacement of any defective fan or motor.

D. Prelubricated and Sealed Shaft Bearings: Self-aligning, pillow-block-type ball bearings.

1. Ball-Bearing Rating Life: ABMA 9, L_{10} of 50,000 hours.

2. Ball-Bearing Rating Life: ABMA 9, L_{10} of 50,000 hours.

E. Vibration Control: Install fans on open-spring vibration isolators having a minimum of 1-inch static deflection and side snubbers.

F. Fan-Section Source Quality Control:

1. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300,

Appendix E

Technical Bulletin CLEANPAK MRPF Multiple/Redundant Plenum Fan

The application of multiple fans in a common system, in part, provided the impetus of the design of the "plug" fan years ago. CLEANPAK International has incorporated multiple fans in common cabinets for several years to provide systems that require redundancy, to meet architectural profile requirements, and for space savings. The arrangements may be vertical up or down flow or horizontal. The notes below apply generally, but often relate to redundancy issues, which is a benefit of multiple fan operation whether a design requirement or not.

General

There are three general arrangements for multiple plenum fan configurations as noted below. Each arrangement has its benefits.

1+1: 2 fans can be provided in a cabinet with either fan capable of supplying 100% of the design flow requirement. This would provide 100% redundancy. Normal operation can be simultaneous or independent.

Twin: 2 fans can be provided in a cabinet with both fans required for the design flow. This arrangement provides capacity in excess of 50% if a single fan fails, since the system pressure drop falls by the square of the volume decrease. Additional capacity can be provided by ramping the VFD up to the limit of the motor full load amps. Normal operation is always simultaneous.

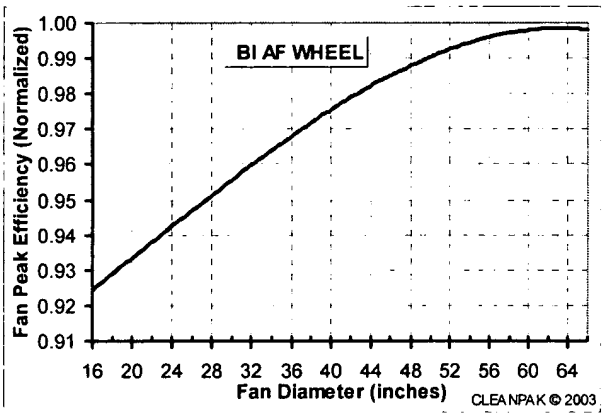
Xn+1: This system provides a measure of redundancy by providing a number of fans smaller than that required by the 1+1 arrangement. The failure of a single fan is accommodated by the initiation of an unused fan, or the ramp up of all remaining fans. The number of fans can be as high as 12-18, although it is not limited. Normal operation is always simultaneous.

Airflow Isolation

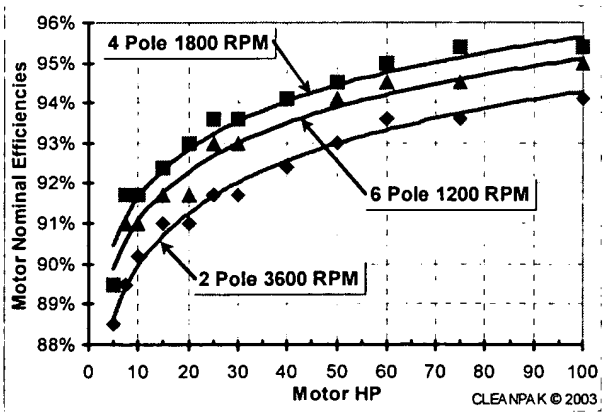
- Inlet or discharge isolation dampers with a solid dividing wall can be provided for fan service of an inoperative fan while operating at design flow for the 1+1 system. The damper pressure drop should be included in the calculation of the total static pressure (TSP).
- An Econo-Disk® may be provided for manual or automatic fan isolation for any of the applications, although as the fans become smaller (18" and under) performance penalties may result. Econo-Disk shutoff characteristics are excellent.
- Inlet isolation dampers can be provided and function similar to, but not as efficiently as, the Econo-Disk. Back draft dampers (heavy duty) can be used but may provide unstable operation at low flows. The damper pressure drop should be included in TSP calculations.
- If some sort of fan isolation is not provided, system performance will suffer a dramatic decrease with a fan failure, due to back flow through the failed fan.

Efficiency

- Larger diameter fans have significantly higher peak efficiencies than smaller diameter fans. Selecting fans at optimum efficiency for an operating point requires the ability to vary wheel width and operating speed.
- Larger motors are significantly more efficient than smaller motors.
- Motors operated at 75% full load are slightly more efficient than those that operate at 100% full load.



Fan efficiencies are generally higher for larger size fans



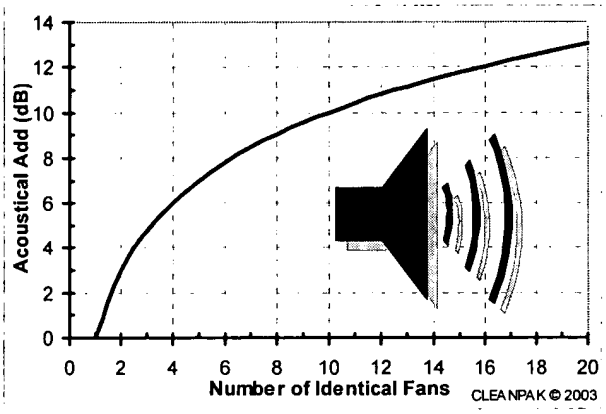
Motor efficiencies are higher for larger size motors

Technical Bulletin CLEANPAK MRPF Multiple/Redundant Plenum Fan

- System efficiency can be improved with internal and external pressure loss reductions such as low velocity coils and high capacity filters.

Dimensions
- For 1+1 systems, inlet and discharge plenum lengths may depend on the normal operating condition. Multiple fan configurations allow for more even velocity profiles for any given length than a single fan configuration.
- Larger fans take more airway length than smaller fans. Service access behind fans is similar for both large and small fans.
- Isolation dampers on the fan inlet increase the airway length.
- Isolation dampers on the fan outlet increase the airway length.
- Large numbers of fans operating as in Xn+1 can reduce the airway length compared to the 1+1 arrangement, particularly if the 1+1 design has an independent operating design rather than a simultaneous operating design.
- Unusual profiles may be accommodated with larger numbers of fans (Xn+1).

Pressure/Volume Control
- VFDs work well when the system follows the fan laws but do not work well if volume varies but the ESP is high and constant, or the fans operate with multiple volumes and constant pressure.
- The Econo-Disk can be used to provide volume control while maintaining design pressure with the simultaneous operation described in 1+1.
- Econo-Disks can be used for both volume and pressure control with manual, pneumatic, or electric actuation.
- Econo-Disks can be used with VFDs for increased flexibility and efficiency.
- Multiple fans such as Xn+1 can be staged and manipulated with VFDs and isolation dampers to offer constant pressure with variable volume.
- Multiple, simultaneous operating fans are generally operated at the same speed.
- Inlet isolation dampers can be used for volume control by "riding the curve" although this is not recommended since it is an inefficient method and may result in unstable operation.



Acoustical add for multiple sources

Sound
- Manufacturers' bare fan sound levels should be adjusted for multiple fan operation. Sound power levels are 11dB higher for 12 fans operating than for only one of the twelve.
- Smaller fans operate at higher speeds than larger fans for any given pressure. This shifts the primary tone of the fan (or blade passage frequency) to higher frequencies and may shift it to a higher octave band. Generally speaking this is advantageous in that higher frequencies are typically attenuated more easily.
- There is a potential for acoustical beats to arise with multiple fan systems.

Vibration Isolation
- 1+1 and twin fan operations are usually internally spring isolated.
- Xn+1 systems with stacked fans, racked, are usually provided without internal isolation, but can be internally spring isolated.

Service
- Smaller fans and motors are easier to physically manipulate than large fans and motors.

Technical Bulletin CLEANPAK MRPF Multiple/Redundant Plenum Fan

- Larger numbers of fans, motors, VFDs, dampers, and damper actuators increase service requirements and increase the potential points of failure.
- Generally a fan will be isolated until a system shutdown for major service, or if the fans are screened service is performed while one or more fans are operating.
- Service in an active air stream, without pressure and flow interference can be performed most easily with an airlock.
- Taperlock fan hubs offer quicker and simpler motor/fan wheel replacements than straight bore hubs.
- Bearing life is unaffected by the number of fans operating (1+1 or Xn+1), as the fewer fans use larger motors and bearings and operate at slower speeds.
- Aluminum wheels reduce the bearing load.
- Spare parts are less costly for small fans compared to larger fans.

Electrical

- 100% redundancy systems (1+1) require greater electrical service requirements than other systems but are as efficient or more efficient during operation.
- If single VFDs are used to run multiple motors, each motor requires separate overload protection. VFD to motor lead length is the sum of all the lead lengths fed by a single VFD.
- Multiple VFDs reduce the need for VFD bypass options.

Initial Cost

- $/CFM are lower for larger fans.
- $/HP are lower for larger motors and VFDs.
- Cabinet costs may be reduced with Xn+1 systems, due to the reduced cabinet length.

In the application of multiple smaller fans, one should consider several factors that affect initial cost, operating efficiency, redundancy, and reliability. The discussion above should help the designer evaluate the various options. Optimizing for single or multiple fan applications calls for flexibility from the air handling unit manufacturer. Please contact CLEANPAK's technical staff for further information and assistance with your application.

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc..
Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

10806775 ZA

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☐ CD(s) containing:
computer program listing ☐
Doc Code: Computer Artifact Type Code: P
pages of specification and/or sequence listing and/or table ☐
Doc Code: Artifact Artifact Type Code: S
content unspecified or combined ☐
Doc Code: Artifact Artifact Type Code: U

☐ Stapled Set(s) Color Documents or B/W Photographs
Doc Code: Artifact Artifact Type Code: C

☐ Microfilm(s)
Doc Code: Artifact Artifact Type Code: F

☐ Video tape(s)
Doc Code: Artifact Artifact Type Code: V

☐ Model(s)
Doc Code: Artifact Artifact Type Code: M

☐ Bound Document(s)
Doc Code: Artifact Artifact Type Code: B

☐ Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.
Doc Code: Artifact Artifact Type Code X

☒ Other, description: AF/D (Appendix A)
Doc Code: Artifact Artifact Type Code: Z

March 8, 2004

CL 172

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION EXAMINING OPERATIONS

Applicant:	Hopkins	Group Art Unit:	3745
Serial No.:	10/806,775	Examiner:	Nguyen, Ninh H.
Filed:	March 22, 2004	Docket No:	Hunt:FanArr1
Title:	Fan Array Fan Section in Air-Handling Systems		

INFORMATION DISCLOSURE STATEMENT
IN ACCORDANCE WITH 37 CFR §1.98

Law Office of Karen Dana Oster, LLC
PMB 1020
15450 SW Boones Ferry Rd. #9
Lake Oswego, OR 97035
March 15, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant submits herewith copies of patents and other art of which he is aware and which he desires to have considered by the Patent Office in accordance with 37 CFR §1.97. In accordance with 37 CFR §1.97(c), this Information Disclosure Statement is being submitted before the mailing date of any of a final action under §1.1113, a notice of allowance under §1.311, or an action that otherwise closes prosecution in the application. This Information Disclosure Statement is accompanied by the fee set forth in §1.17(p).

In accordance with 37 CFR §1.97(h), the filing of this Information Disclosure Statement will not be regarded as an admission that any art referred to herein is, or is considered to be, material to patentability under 37 CFR §1.56(b).

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Application No. 10/806,775
Information Disclosure Statement dated March 15, 2005

Applicant was provided this information by Ms. Molly D. McKay, Attorney for AAON. AAON is a competitor of the assignee of the present invention. It is applicant's understanding that a Protest Under 37 CFR 1.291(a) was filed by Ms. McKay. In that Protest, Ms. McKay set forth a description of the art submitted herewith. Applicant makes no admission with respect to the accuracy of the description. Applicant makes no admission with respect to the dates of the art.

A list of the patents enclosed herewith is set forth on the attached single page of Form PTO/SB/08B.

The person making this statement is the attorney who signs below on the basis of the information supplied by the inventor and the information in the file.

Please charge Deposit Account No. 50-2115 for any additional fees which may be required.

Respectfully submitted,

Karen Dana Oster
Reg. No. 37,621
Of Attorneys of Record
Tel: (503) 810-2560

PTO/SB/08b (08-03)
Approved for use through 06/30/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

	Complete If Known
Application Number	10/806,775
Filing Date	March 22, 2004
First Named Inventor	Hopkins
Art Unit	3745
Examiner Name	Nguyen, Ninh H.
Attorney Docket Number	Hunt:FanArr1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		AAON, RL Series Rooftop Conditioners, 09/01	
		Jim Parro (Marketing Mananager for AAON) New Promotional Literature The RL Series	
		AAON, RL Series 45 to 230 tons Packaged Rooftop Conditioners & Air Handlers	
		AAON, Invocie No. 265184, 2/28/02	
		AAON, Order Form and Associated Documents, 11/14/01	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc..
Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

10806795 BA

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

☐ CD(s) containing:
computer program listing ☐ Artifact Type Code: P
Doc Code: Computer
pages of specification and/or sequence listing and/or table ☐ Artifact Type Code: S
Doc Code: Artifact
content unspecified or combined ☐ Artifact Type Code: U
Doc Code: Artifact

☐ Stapled Set(s) Color Documents or B/W Photographs
Doc Code: Artifact Artifact Type Code: C

☐ Microfilm(s)
Doc Code: Artifact Artifact Type Code: F

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☐ Model(s)
Doc Code: Artifact Artifact Type Code: M

☑ Bound Document(s)
Doc Code: Artifact Artifact Type Code: B

☐ Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.
Doc Code: Artifact Artifact Type Code X

☐ Other, description: _____
Doc Code: Artifact Artifact Type Code: Z

March 8, 2004

CL 176

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2003

Application or Docket Number: 10806775

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	20	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	20 minus 20=	*
INDEPENDENT CLAIMS	2 minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	385.00	OR	BASIC FEE	770.00
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL	385	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 31	Minus	** 20	= 11
Independent	* 2	Minus	*** 3	= —
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
~~X$ 9=~~ 25	275	OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE	275	OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

26790 7590 04/26/2005

LAW OFFICE OF KAREN DANA OSTER, LLC
PMB 1020
15450 SW BOONES FERRY ROAD #9
LAKE OSWEGO, OR 97035

EXAMINER	
NGUYEN, NINH H	
ART UNIT	PAPER NUMBER
3745	

DATE MAILED: 04/26/2005

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,775	03/22/2004	Lawrence G. Hopkins	HUNT:FANARR1	2371

TITLE OF INVENTION: FAN ARRAY FAN SECTION IN AIR-HANDLING SYSTEMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	07/26/2005

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 12/04) Approved for use through 04/30/2007.

CL 178

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (703) 746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26790 7590 04/26/2005

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (703) 746-4000, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,775	03/22/2004	Lawrence G. Hopkins	HUNT:FANARR1	2371

TITLE OF INVENTION: FAN ARRAY FAN SECTION IN AIR-HANDLING SYSTEMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	07/26/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NINH H	3745	415-119000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1_____

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2_____ 3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

☐ A check in the amount of the fee(s) is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,775	03/22/2004	Lawrence G. Hopkins	HUNT:FANARR1	2371

26790 7590 04/26/2005

LAW OFFICE OF KAREN DANA OSTER, LLC
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LAKE OSWEGO, OR 97035

EXAMINER	
NGUYEN, NINH H	
ART UNIT	**PAPER NUMBER**
3745	

DATE MAILED: 04/26/2005

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PTOL-85 (Rev. 12/04) Approved for use through 04/30/2007.

CL 180

Notice of Allowability	Application No.	Applicant(s)	
	10/806,775	HOPKINS, LAWRENCE G.	
	Examiner	Art Unit	
	Ninh H. Nguyen	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment dated 03/21/05*.

2. ☒ The allowed claim(s) is/are *1-31*.

3. ☒ The drawings filed on *22 March 2004* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 03/21/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Ninh H. Nguyen
NINH H. NGUYEN
PRIMARY EXAMINER

PTO/SB/08b (08-03)
Approved for use through 06/30/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete If Known	
Application Number	10/806,775
Filing Date	March 22, 2004
First Named Inventor	Hopkins
Art Unit	3745
Examiner Name	Nguyen, Ninh H.
Attorney Docket Number	HuntFanArr1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
NHN		AAON, RL Series Rooftop Conditioners, 09/01	
NHN		Jim Parro (Marketing Mananager for AAON) New Promotional Literature The RL Series	
NHN		AAON, RL Series 45 to 230 tons Packaged Rooftop Conditioners & Air Handlers	
NHN		AAON, Invocie No. 265184, 2/28/02	
NHN		AAON, Order Form and Associated Documents, 11/14/01	

Examiner Signature	Ninh H. Nguyen	Date Considered	04/20/05

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.